

December 14, 1841.

Richard Owen, Esq., Vice-President, in the Chair.

A letter from the Society's corresponding member, J. B. Harvey, Esq., was read.

A letter from Mr. Fraser, dated from the mouth of the river Nùn, W. Africa, August 14, 1840, was next read. In the first part of his letter, Mr. Fraser, the naturalist to the Niger expedition, alludes to a collection of specimens which he had formed during his passage out, and which he had forwarded to England. This collection consists of three mammals, nearly fifty birds, twenty-eight reptiles, upwards of thirty fishes, and about forty boxes, bags, &c. containing chiefly insects and shells. The writer expresses a wish that this collection may not be regarded as a specimen of what may be hereafter expected, since he had purposely abstained, as much as possible, from using his materials for preserving specimens until his arrival at the Niger.

The letter moreover contains some interesting facts relating to the habits and habitats of certain animals. Among the skins of Mammalia, Mr. Fraser observes, he had forwarded a *Galago* which was shot at Cape Coast, close to the town, in a tamarind tree, where he also found its nest, built, or rather laid, in a fork formed by the branches. The nest was composed of loose leaves. The animal resembled the *Loris gracilis*, but its limbs were stouter. The following monkeys, Mr. Fraser states, appear to be found in the neighbourhood of Sierra Leone: *Troglodytes niger*, *Colobus ursinus*, *Cercopithecus fuliginosus*, common, *Cerc. Sabæus*, and *Cynocephalus Papio*. The banks of the beach are everywhere perforated with large round holes, which the natives informed Mr. Fraser were inhabited by an animal which they call the Ground-pig, which is the *Aulacodus Swin-derianus* of Temminck. At Bassa, the author of the letter saw some skins of *Cercopithecus Diana*, said to be common in that district; he also saw a skin of an antelope, apparently the *Antilope Ogilbyi*, Waterh. At Cape Coast the *Cercopithecus petaurista* is to be found, and likewise the *Colobus leucomeros*. Skins of the last-mentioned animal as well as of the *Cercopithecus Diana* were extremely plentiful at Accra.

The following paper, by Mr. Lovell Reeve, "On *Lingula*, a genus of Brachiopodous Mollusks," was then read:—

"The *Lingulæ* belong to a group of Bivalve Mollusks differing materially in their system of organization from any other of the great tribe of *Acephala*. They have received the title of 'the *Brachiopoda*,' on account of their being provided with two long

spirally twisted arms, and are distinguished by other not less important particulars. The soft parts are differently arranged within the shell from those of other Bivalves; the valves are not united by any ligament, and there is a very distinct change in the arrangement and position of the breathing apparatus. Although Pallas has given a short anatomical description of the *Terebratulæ*, it was not until the appearance of Cuvier's memoir on the anatomy of *Lingula*, that the true characters of these remarkable animals became known; it was then determined that the *Brachiopoda* should be set apart in a separate and distinct class. The anatomy of the *Terebratulæ* and *Orbiculæ* has since been most elaborately set forth by Prof. Owen in the Transactions of this Society, and agrees in all its essential particulars with that of the *Lingulæ* previously described by Cuvier; subject, however, to certain modifications arising from the different situations they inhabit. The *Lingulæ*, which are provided with a long pedicle, commonly live near the surface, and are found at low water, partially buried in the sand for the protection of their fragile shells against the violence of the tides; the *Terebratulæ*, on the contrary, are found in deep water, attached in clusters to fragments of rocks and corallines by a bunch of short fibrous tendons issuing through an orifice in the shell.

“The essential points in which these animals differ from other Bivalve Mollusks are as follow:—*First*, in the position of the soft parts within the shell: in the *Brachiopoda* the dorsal part of the visceral mass is against one valve, and the ventral part against the other; whilst in most of the *Tropiopoda* the back is placed directly against the hinge, and the sides against each valve. *Secondly*, in being provided with a pair of retractile brachia or arms: in the place usually occupied by the branchiæ, are two long spirally twisted arms, generally more or less fringed, and so strongly resembling in some species the branchiæ of the *Tropiopoda*, that they were at one time thought to be the true organs of respiration. These retractile arms are said to be in constant activity for the purpose of producing an inward current of water for the capture of animalculæ, and other alimentary prey. *Thirdly*, in the arrangement and position of the branchiæ: instead of the organs of respiration being distinctly formed in lateral lamellæ upon the body, as in the *Lamelli-branchiate Tropiopoda*, they consist of a number of beautiful veins and arteries incorporated within the substance of the two lobes of the mantle. The calcifying organ of the *Brachiopoda* therefore has a double function: in addition to its usual property of secreting the calcareous mucus for the formation of the shell, it is made subservient to the circulation of the aërated water. Prof. Owen observes, ‘that in this profuse distribution of vessels over a plain membranaceous surface, we perceive the simplest construction of the *water-breathing* organ, presenting a beautiful analogy with the elementary forms of the *air-breathing* organ in the *pulmoniferous Gasteropoda*.’ In consequence of this new arrangement of the respiratory system, the title of the *Brachiopoda* has been changed by De Blainville for that of the *Palliobranchiata*, or mantle-breathing Mollusca. The

muscular system in these animals appears to be most complex; the *Lingula* and *Orbicula* are provided with three pairs of muscles, and the *Terebratulæ* have four. The large muscles are destined to open and close the shell in the absence of a hinge ligament; and the small ones assist in sliding one valve over the other for the admission of water.

“Until within the last few years only one species of *Lingula* was known, and previous to the publication of Cuvier’s memoir, before alluded to, the shell of this singular animal gave rise to much speculation amongst naturalists. Linnæus, upon the discovery of an odd valve of *Lingula* exhibiting no trace of any hinge ligament, described it as a *Patella*. Both Rumphius and Favanne took it to be the calcareous shield of a *Limax* or land-slug. Chemnitz, upon finding that the shell of *Lingula* was really bivalve, placed it with the *Pinnæ*; and even Dillwyn includes it with the *Mytili*. Bruguière was the first to distinguish it by its present title in the plates of the ‘Encyclopédie Méthodique,’ in which he has been followed by Cuvier, Lamarck, and all succeeding writers.

“With regard both to the situation that the *Brachiopodous Mollusca* should occupy in the natural system, as well as the rank to which they are entitled in the classification, authors have been much divided. By Dumeril and De Roissy they were associated in a particular class with the *Lepades*, on account of a fancied resemblance in their spirally twisted arms to the cirrous tentacula of those animals; they differ however in not being articulated, and their relation altogether with the *Lepades* is one of very remote analogy. Cuvier distinguished them as a new and separate class, but still arranged them next in order to the *Lepades*. Lamarck placed them at the end of his ‘*Conchifères monomyaires*’ merely as a family of that order. Prof. Owen and Deshayes both consider that they are entitled to take the rank of an order; the latter author however admits that there is far less affinity between the *Brachiopoda* and the rest of the acephalous mollusks, than there is between the acknowledged divisions of *Bimuscular* and *Unimuscular*. In the arrangement of my ‘*Systematic Conchology*’ I propose to adopt the still higher rank that was assigned to them by Cuvier, namely, that of a class, placing them according to Lamarck, at the end of the *Acephala*, upon the presumption that their branchial apparatus presents a modification of structure intermediate between that of the proximate classes, the *Tropiopoda* and the *Gasteropoda*.

“The *Lingula* come with great propriety at the commencement of the class, because they have the nearest affinity with the *Tropiopoda*; their body is larger in proportion to that of the rest of the *Brachiopoda*, and although the branchiæ are incorporated within the substance of the mantle, they nevertheless present a certain indication of the lamellar structure. Lamarck placed them at the end of his family of ‘*Les Brachiopodes*,’ because, in having referred the *Crania* to his fossil family of ‘*Les Rudistes*,’ he found it necessary to follow up their affinity with the *Orbicula*; his arrangement of the genera therefore is the reverse of that I have adopted.

“ The *Lingula anatina* was for a long time the only species known ; another one, the *Lingula hians*, was described by Swainson in his ‘ Zoological Illustrations,’ and we are indebted to Mr. Cuming for five new ones ; two, the *Lingulae Audebardii* and *semen*, have been already described by Mr. Broderip in the Transactions of this Society, and I have now the pleasure of introducing three which I believe to be entirely new to science.

LINGULA OVALIS. *Ling. testá angustá, elongato-ovali, glabrâ quasi politâ, olivaceo-viridi ; apice acuminato ; valvis utrinque clausis.*

Hab. — ?

Long. $1\frac{3}{10}$; lat. $\frac{6}{10}$ poll.

“ This shell, which approaches rather in appearance to that of the *Lingula anatina*, may nevertheless be distinguished by its complete oval form ; though it is somewhat acuminated at the apex, the umbones are much less prominent, and the valves are more compressed, and more closely united all round.

LINGULA TUMIDULA. *Ling. testâ corned, tenuissimâ, rubro-olivaceâ, subquadratâ, versus apicem parùm attenuatâ, umbonibus vix prominulis ; valvis tumidulis, marginibus irregulariter reflexis.*

Hab. ad oras Novæ Hollandiæ.

Long. $2\frac{1}{10}$; lat. $1\frac{3}{10}$ poll.

Reeve, Conch. Syst. v. i. p. 180. pl. 125. f. 4.

“ The shell of the *Lingula tumidula* differs materially, both in size and composition, from that of any of the previously known species ; it is considerably larger and thinner, and rather horny than calcareous, and the colour of it is a burnt olive-red. From the swollen appearance of the valves I am inclined to think that the shell is perfectly pliable and elastic during the life of the animal.

LINGULA COMPRESSA. *Ling. testâ corned, tenuissimâ, valdè compressâ, fusco-olivaceâ, subquadrato-ovali, versus apicem attenuatâ, umbonibus depressis, indistinctis ; valvis utrinque clausis.*

Hab. ad Palanam, ins. Masbate, Philippinarum.

Long. $1\frac{8}{10}$; lat. $1\frac{1}{10}$ poll.

“ This curious species was found by Mr. Cuming in sandy mud at low water at Palanas, Island of Masbate, one of the Philippines. Its shell is of the same thin horny composition as that of the *Lingula tumidula* ; in fact I at first took it to be merely a local variety of that species. Upon comparison however I feel assured that it is distinct ; it is more attenuated towards the apex, and from the valves being remarkably compressed and closely united all round, I am induced to suppose that the animal must be proportionably smaller. The two specimens from which the above description is drawn do not exhibit the pallial cilia, which Mr. Cuming’s usual care would have protected ; they may therefore not have been exerted beyond the margin of the valves. He did not succeed in obtaining the pedicle of this species.

“ Mr. Cuming exhibits on this occasion specimens of all the known *Lingula* from his own collection, and I am not aware that four

species out of the seven exist in any other. They belong to a class of mollusks of which few recent varieties are known, and may therefore be highly esteemed for their conchological interest."

The next paper read was from Mr. G. B. Sowerby, jun., and is entitled "Descriptions of nine species of the genus *Pupina*."

Gen. PUPINA, Vignard.

Molluscum terrestre.

Testa subcylindrica, vitrea, nitidissima, anfractibus quinque ad sex, penultimo inflato, ultimo paululum coarctato; aperturâ circulari, margine crasso, reflexo, ad basin columellæ inciso, vel emarginato.

Operculum corneum, spirale.

The glassy enamel, which gives a brilliant polish to the small, terrestrial shells composing this genus, seems to distinguish them even from those species of *Cyclostoma* which most nearly resemble them, in having a pupiform shape, and a notch at the base of the columella. The question has been asked, "Why not make this marginal notch the criterion of the genus?" The answer is found in the following facts: first, the notch is found in *Cyclostomata*, which have no other character in common with *Pupinæ*; second, that several *Cyclostomata* have a canal at the lower part of the whorl, which if continued would form a similar notch; third, that our *Pupina lubrica*, which could scarcely be separated from the genus, has but a very slight emargination.

The first species described under this generic name was *P. Keraudrenii*, published by Vignard in the 'Annales des Sciences,' 1829.

Mr. Grateloup subsequently described *P. Nunezii* under the generic name *Moulinisia*, neither of these naturalists being acquainted with the operculum.

All the species here described, with the exception of *P. antiquata* and *P. Keraudrenii*, were recently brought to this country by Mr. Cuming from the Philippines.

* Species spirâ axe retrorso.

PUPINA NUNEZII. *Moulinisia Nunezii*, Grateloup, Ann. Soc. Linn. Bordeaux, 1840. *P. Nunezii*, Sow. jun., Thesaurus Conchyliorum, part 1. f. 8, 9, 10, 11. Published May 1842. *Testa globosa, obliqua; aperturâ magnâ, margine validè expanso, reflexo, complanato, incisurâ triangulari penitùs diviso; labio columellari concavo: anfractu ultimo propè aperturam subcomplanato.*

Long. .50; lat. .35 poll.

Hab. ad insulas Samar, Luzon, Catanduanus et Siquijor, Philippinarum.

Var. a. *Fusca margine flavido.* Samar.

Var. b. *Flavida, margine aurantiaco.* Albay, ins. Luzon.

Var. c. *Fulva rufescens.* Ins. Catanduanus.

Var. d. *Alba, propè aperturam purpureo-cincta, margine flavido.*
Ins. Leyte.

More globose than any other species, the spire turned backwards,